

# FAA <sup>R E P R I N T</sup> Aviation news

AVIATION SAFETY FROM COVER TO COVER

**KEEPING SAFE  
IN THE DESERT**





U.S. Department  
of Transportation

**Federal Aviation  
Administration**

Norman Y. Mineta, *Secretary of Transportation*  
Jane F. Garvey, *FAA Administrator*  
Nicholas A. Sabatini, *Associate Administrator  
for Regulation and Certification*  
James Ballough, *Director,  
Flight Standards Service*  
Robert A. Wright, *Manager,  
General Aviation and Commercial Division*  
Phyllis Anne Duncan, *Editor*  
Louise C. Oertly, *Senior Associate Editor*  
H. Dean Chamberlain, *Forum Editor*  
A. Mario Toscano, *Associate Editor/Art Director*  
Deidria Shaw, *Administrative Assistant*

The FAA's Flight Standards Service, General Aviation and Commercial Division, Publications Branch, AFS-805, Washington, DC 20591; telephone (202) 267-8212, FAX (202) 267-9463; publishes FAA AVIATION NEWS in the interest of flight safety. The magazine promotes aviation safety by calling the attention of airmen to current technical, regulatory, and procedural matters affecting the safe operation of aircraft. Although based on current FAA policy and rule interpretations, all printed material herein is advisory or informational in nature and should not be construed to have regulatory effect. The FAA does not officially endorse any goods, services, materials, or products of manufacturers that may be mentioned. **Certain details of accidents described herein may have been altered to protect the privacy of those involved.**

The Office of Management and Budget has approved the use of funds for the printing of FAA AVIATION NEWS.

**SUBSCRIPTION SERVICES**

The Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-9371, sells FAA AVIATION NEWS on subscription. Use the self-mailer form in the center of this magazine to subscribe.

**CHANGE OF ADDRESS OR SUBSCRIPTION PROBLEMS**

Send your label with correspondence to Sup Doc, Attn: Chief, Mail List Branch, Mail Stop: SSOM, Washington, DC 20402-9373. Or call GPO Customer Service at (202) 512-1800/6; FAX: (202) 512-2168.

To keep subscription prices down, the Government Printing Office mails subscribers only one renewal notice. You can tell when your subscription ends by checking the date on the second line of your mailing label. To be sure that your service continues without interruption, please return your renewal notice promptly.

\*\*\*\*\*3-DIGIT 342  
FAN SMITH212J JUN96 R 1 423\*  
JOHN SMITH  
212 MAIN ST  
FORESTVILLE MD 20747

<http://www.faa.gov/avr/news/newshome.htm>

# FAA Aviation news

JULY 2002  
R E P R I N T



1

## Keeping Safe in the Desert



16

## Night Vision Dangers





# KEEPING SAFE IN THE DESERT

story and photos by H. Dean Chamberlain

As the hottest months of summer approach, you and your passengers flying over isolated desert areas in the U.S. need to review your options when operating over such areas. How you operate can be a matter of survival if you are not prepared to spend a day or two in the desert. So, what is the secret of surviving in the 21st Century American desert?

Surprisingly, many of the same things learned from the last century and the previous centuries still apply only now updated for aviation. Proper planning, good route selection, water, an activated flight plan, an aircraft frequency transceiver, and a cell phone or satellite phone are all good ideas for starters. There are more things you should consider most of which are based upon good, basic common sense and tried and true survival ideas.

The intent of this article is not to make you a desert expert or long-term desert survivor. Our goal is to simply remind any pilot planning on flying over any of the remote areas of the American West of the potential risks and dangers that await the unprepared and to offer some suggestions on how to reduce the risk of flying over that terrain.



*“Fly high and within gliding distance of a highway.”* Park Richardson, Hi-Desert Airport.



### **A QUICK NOTE ABOUT CELL PHONES, TELEPHONES AND PAGERS**

If you carry a cell phone for emergency purposes, you should review your service's geographic signal coverage area for the part of the country you will be flying over. In some remote areas, cell phones are not usable. In other areas, your cell phone service provider's operating area may only extend along major highways or near major cities. You may be so remote that your cell phone can't "roam" as well. Such things as your cell phone service provider and type of cell phone are all factors. Even the type of cell phone such as digital or analog, or whether it is a dual or tri band cell phone all help determine your area of coverage.

Unlike cell phones, which depend upon ground based reception, satellite telephones can work anywhere they have one of their satellites in view. Satellite phone service can provide global service with the right equipment. The major problem with satel-

lite phones is their cost.

In some cases, if you have the right type of two-way pager service, you might be able to send a message via your pager.

In real-life threatening situations, you should try to use whatever communications means you have including your aircraft radio if there is no danger of fire or explosion. Even if you can't receive a message, there is always the chance your transmitted message might have been received by someone. As explained below, you should never give up hope. When sending any message in the blind, always remember to include your location, name, and aircraft number. The number of people with you and their status are also important. Because hi-tech items and batteries can fail, you should consider alternative means of alerting.

### **A WORD ABOUT SURVIVAL KITS**

Although search and rescue experts always include in their safety dis-

cussions the importance of carrying a survival kit, how many pilots really do carry one in their aircraft? How many pilots even carry the generally recognized 10 essential survival items on their person when they go hiking, walking, or traveling off the beaten path? If you are one of those who do carry a survival kit, when was the last time you inspected it? Are the materials and supplies still good? Or, did they dry out and expire five years ago? Is your medical kit current? Is your water—you do have some water in your kit—still drinkable?

In addition to water, survival kits should be site-specific and based upon time of year, the anticipated environmental conditions, and anticipated time of rescue. Some items are generic. For example, waterproof matches are waterproof matches. But the dry heat and cold of an American desert requires different items than the wet and cold areas of say the Pacific Northwest. Each environment requires specific items for comfortable survival. Remember that we are talking comfortable survival because we





are aviators and can carry such items. We are not hikers limited by what we can carry on our backs. We can take what we need. Plus, if you do everything right, you may not have to use your survival items.

### **BROKEN EGGS IN YOUR BASKET**

Water containers are like the story about putting all of your eggs in one basket. If your aircraft's "survival" water container is the thin, plastic one-gallon jug you bought at your corner grocery store on the way to the airport, maybe you need something else to carry your water in when you go aviating in your Mark I Family Cruiser. At the impact forces generated in an aircraft crash, even if you survive, will your gallon of water survive if it goes bouncing around? It probably will not. It could also hit you. A gallon of water could do a lot of damage to both you and your aircraft. But, if you had bought a six- or eight-pack of water in the small one liter or similar size bottles, maybe one or two or more of those smaller bottles might survive. Unlike your one-gallon container, if one of the smaller bottles breaks, all of your water will not be lost. Pilots may need to learn how to protect their "basket of eggs."

### **IMPORTANCE OF FLIGHT PLANS: CHEAP INSURANCE**

Before we get too deep into desert flight, no safety review would be complete without reminding everyone of the importance of filing and activating a flight plan before every trip. If the flight plan is a VFR flight plan, VFR flight plans must be opened and closed by the pilot. IFR flight plans are normally opened and closed by air traffic control.

For this article, we are talking about VFR flight plans. Both types of flight plans do two important things for safety.

First, they show route of flight. If you give updated position reports or are in radar contact, the flight plan and position reports narrows the search

area along your designated route in case you fail to arrive at your destination. The smaller the search area, the more resources that can be dedicated to look for you. Even an entire route search is better than not knowing what state the crash site might be in. Just remember the smaller the search area, the greater the probability of discovery and recovery. This is particularly important if anyone is injured and

needing immediate medical care.

Second, flight plans provide a positive means of alerting and validating search and rescue about a missing aircraft. In the safety business, there are stories about VFR aircraft not being missed for days after a crash because no one knew the aircraft was missing. No flight plan had been filed, and the pilot was not expected back home for several days or longer. The

*Heat is not the only danger in the desert. These wind generators guard an important mountain pass northwest of Palm Springs, California.*







old cliché of out of sight, out of mind applies. Flight plans give you the best chance of being found. Remember that 30 minutes after your VFR filed or updated expected arrival time and you have not closed your flight plan, FAA starts its preliminary search notification process.

Combine a flight plan with its alerting benefits and a functioning emergency locator transmitter (ELT), preferably a 406 MHz ELT (one with GPS is better), and you have a good alerting system. So you can just sit back and relax until help arrives? Not quite.

### **ELT RESPONSE TIMES: THE GOOD AND THE BAD**

Remember, we said an activated flight plan and ELT were good. But is good—good enough? Let's review what happens in an aircraft accident without an activated flight plan. In this scenario, like in many cases, the first notification of a possible crash is an ELT signal. However, having an ELT

onboard is not a guarantee that someone knows you are down. The ELT could have been damaged in the accident and cannot function, or the crash forces may not have been hard enough to activate the device. This is why it is important to try to monitor the ELT on your aircraft's radio or your handheld transceiver on 121.5 MHz when possible and when it can be done safely without risking a fire or explosion from spilt fuel.

In a situation where the ELT works as designed, the problem is, in the case of a 121.5 MHz only ELT alert with no flight plan on file, it can be many hours before search and rescue efforts are launched. The delay is because of the many false alerts the satellite rescue system receives. Without an FAA report of a missing aircraft, the satellite folks wait for multiple alerts or "hits" to try and validate the distress alert before deciding if it is a real alert and not some random signal. Once they determine it is a real alert, which may or may not signal an air-

craft accident, they notify the appropriate national rescue coordination center (RCC) which then decides on the appropriate course of action. All of this can take many hours. What this means to you is that you may have to survive your injuries or the local environmental conditions for hours before someone even starts to look for you.

If you want to speed up the search process, you may want to buy one of the newer digitally encoded 406 MHz ELT's. Not only does the 406 MHz ELT transmit with more power, if properly registered with the owner's data on file at the National Oceanic and Atmospheric Administration (NOAA) Mission Control Center (MCC), rescue forces can be launched as soon as NOAA receives the signal and the appropriate organization calls the emergency telephone numbers included in the registration data and validates the distress alert. Thus, search action can be started in minutes instead of hours in the case of the older 121.5 MHz only ELT.



## 121.5 MHz SATELLITE MONITORING PHASEOUT

In 2009, the satellite monitoring of 121.5 MHz distress alerts is scheduled for termination. Once that happens, 121.5 MHz ELT distress alerts will only be monitored by over-flying aircraft or nearby air traffic control (ATC) facilities. What this means is no over-flights or nearby ATC facilities: no detection. If your aircraft's ELT is a 121.5 MHz only model, you could be waiting a lot longer for rescue. Flight plans will become critical in 2009 for distress alerting unless you equip your aircraft with a 406 MHz ELT. The rescue distress alerting satellite system will continue to monitor for 406 MHz ELT's and other 406 MHz distress-alerting devices.

## DESERT FLYING

Desert survival means two things to *FAA Aviation News*. First is surviving your flight. The second is surviving

your off-airport landing (crash) until help arrives.

Having lived and flown in the desert southwest corner of Arizona and the adjoining southeastern portion of California for several years and having flown searches for missing aircraft as well as talking to others who routinely flew in that area, I can say without reservation that safe desert flying begins with good planning.

## HOW HOT IS HOT?

As we go into the summer flying season, it is time for those planning on flying in desert areas to start to think about flying and surviving in "desert country." The reason is simple. It is common for daytime temperatures in some of the western deserts to range from 100 to 115 degrees Fahrenheit in the shade. Temperatures can exceed 125 degrees or more in the sun. Then temperatures can drop significantly overnight. For those who live and fly in such conditions, they know how to handle the "what if" scenarios that can

possibly happen on any given flight. But like in mountain flying, the problem is not those who live and fly there. The problem is those who don't live there but who want to visit or who must over fly the area to go someplace else.

## AIRCRAFT PERFORMANCE AND TRICKS OF THE TRADE IN THE DESERT

As Mr. Park Richardson, owner of Hi-Desert Airport, Joshua Tree, California, which is in the high desert area about 110 nautical miles NE of Los Angeles International Airport, reminded me in February, there are good times to fly in the desert and bad times. He told of pilots flying through his airport, elevation 2,464 feet MSL, in the summer who could not understand why their aircraft were not flying "just quite right." The fact it was summer, very hot, and the aircraft were loaded near gross weight might have had something to do it. He said that in many cases the problem was the

# PERIOD OF RECORD MONTHLY CLIMATE SUMMARY

The following data highlights, for the years indicated, the average maximum and the average minimum temperatures for select areas of the American West. The data shows the type of temperatures one can expect either flying through the area or must be prepared for in the event of an off-airport landing.

	DEATH VALLEY, CA (4/61 - 12/2002)		LAKE HAVASU CITY, AZ (3/91 - 9/2000)		GILA BEND, AZ (12/1892 - 12/2000)		EL CENTRO, CA (7/48 - 12/2002)		TWENTYNINE PALMS, CA (7/48 - 12/2000)		LAS VEGAS, NV (2/37 - 12/2000)		SALT LAKE CITY, UT (7/48 - 12/2000)	
	AV HIGH (°F)	AV LOW (°F)	AV HIGH (°F)	AV LOW (°F)	AV HIGH (°F)	AV LOW (°F)	AV HIGH (°F)	AV LOW (°F)	AV HIGH (°F)	AV LOW (°F)	AV HIGH (°F)	AV LOW (°F)	AV HIGH (°F)	AV LOW (°F)
JAN	65.9	39.1	67.3	44.8	68.8	38.5	69.6	39.9	62.9	35.5	56.8	33.8	37.4	20.2
FEB	73.6	46.1	72.7	48.7	73.7	41.7	74.3	43.6	68.2	38.9	62.6	38.5	43.7	24.8
MAR	80.9	53.7	79.9	53.0	79.7	46.0	79.2	47.4	74.0	42.8	69.3	43.6	52.4	31.5
APR	89.7	61.4	89.1	59.6	88.0	51.6	86.4	52.7	82.2	49.3	78.2	51.1	61.5	38.0
MAY	99.2	71.2	98.3	69.7	96.6	59.4	94.4	59.4	90.8	56.8	88.1	60.2	71.9	46.1
JUN	108.8	80.2	107.3	76.9	106.0	68.0	103.6	67.1	100.5	64.8	98.4	69.1	82.9	54.3
JUL	115.1	86.9	112.3	84.6	108.9	77.9	107.6	75.2	105.3	71.5	104.4	75.7	92.4	62.5
AUG	113.6	85.1	111.8	85.4	107.1	76.6	106.4	75.6	103.4	70.4	102.1	74.2	90.3	61.3
SEP	105.6	75.1	104.5	77.3	103.0	69.8	102.1	69.2	97.3	63.6	94.6	65.8	79.5	51.2
OCT	92.8	61.4	92.1	62.6	92.1	57.0	91.7	58.3	85.9	52.5	81.4	53.7	65.8	40.0
NOV	76.2	47.6	75.6	50.5	78.5	45.0	78.5	46.6	71.9	41.6	66.4	41.3	50.1	29.7
DEC	65.2	38.1	65.6	43.6	69.2	38.7	69.8	39.6	63.3	35.4	57.5	34.3	38.6	22.1
ANNUAL	90.5	62.2	89.7	63.0	89.3	55.8	88.6	56.2	83.8	51.9	80.0	53.4	63.9	40.1

This data was extracted from the Internet through the Western Regional Climate Center, a Division of Atmospheric Sciences Desert Research Institute. The Western Regional Climate Center (WRCC) is one of six regional climate centers in the United States. The Regional Climate Centers Program is administered and funded by the National Oceanic and Atmospheric Administration (NOAA). The Desert Research Institute is an element of the University and Community College System of Nevada.



pilots had failed to compute density altitude. Density altitude is critical when operating in the summer in the deserts and mountains of the west. High temperatures and high elevations can spell trouble for those not prepared. As Richardson said, pilots need to know their aircraft's performance limitations.

As he pointed out, there are several things pilots can do to help themselves. The first is to compute density altitude and compare it to their aircraft's performance data. As he said, the secret is to know your aircraft's numbers.

He said, "Pilots can also plan to fly early in the morning or late at night if

they are operating near their aircraft's gross weight. The cooler temperatures make for better performance and a smoother ride."

He said mid-day thermals boiling off the desert can make for a very rough ride at low altitude. Another option he said is for pilots to carry less weight in the aircraft. Again, this in-

## TAKEOFF DISTANCE - SHORT FIELD

### Cessna 172N

2,300 lbs., 2,100 lbs., and 1,900 lbs.

#### CONDITIONS:

Flaps Up

Full Throttle Prior to Brake Release

Paved, Level, Dry Runway

Zero Wind

#### NOTES:

1. Short field technique as specified in Section 4.

2. Prior to takeoff from fields above 3,000 feet elevation, the mixture should be leaned to give maximum RPM in a full throttle, static runup.

3. Decrease distances 10% for each 9 knots headwind. For operation with tailwinds up to 10 knots, increase distances by 10% for each 2 knots.

4. For operation on a dry, grass runway, increase distances by 15% of the "ground roll" figure.

WEIGHT LBS	TAKEOFF SPEED KIAS		PRESS ALT FT	0°C		10°C		20°C		30°C		40°C	
	LIFT OFF	AT 50 FT		GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS
2,300	52	59	S.L.	720	1,300	775	1,390	835	1,490	895	1,590	960	1,700
			1,000	790	1,420	850	1,525	915	1,630	980	1,745	1,050	1,865
			2,000	865	1,555	930	1,670	1,000	1,790	1,075	1,915	1,155	2,055
			3,000	950	1,710	1,025	1,835	1,100	1,970	1,185	2,115	1,270	2,265
			4,000	1,045	1,880	1,125	2,025	1,210	2,175	1,300	2,335	1,400	2,510
			5,000	1,150	2,075	1,240	2,240	1,335	2,410	1,435	2,595	1,540	2,795
			6,000	1,265	2,305	1,365	2,485	1,475	2,680	1,585	2,895	1,705	3,125
			7,000	1,400	2,565	1,510	2,770	1,630	3,000	1,755	3,245	1,890	3,515
			8,000	1,550	2,870	1,675	3,110	1,805	3,375	1,945	3,670	2,095	3,990
2,100	50	56	S.L.	585	1,070	630	1,140	680	1,220	725	1,300	780	1,390
			1,000	640	1,165	690	1,245	740	1,330	795	1,420	850	1,520
			2,000	700	1,270	755	1,360	810	1,455	870	1,555	935	1,665
			3,000	770	1,390	830	1,490	890	1,595	955	1,710	1,025	1,830
			4,000	845	1,525	910	1,640	980	1,755	1,050	1,880	1,130	2,015
			5,000	930	1,680	1,000	1,805	1,075	1,935	1,155	2,075	1,240	2,230
			6,000	1,025	1,850	1,100	1,990	1,185	2,140	1,275	2,300	1,370	2,475
			7,000	1,130	2,050	1,215	2,210	1,310	2,380	1,410	2,560	1,515	2,755
			8,000	1,245	2,275	1,345	2,460	1,450	2,655	1,560	2,865	1,680	3,090
1,900	47	54	S.L.	470	865	505	920	540	985	580	1,045	620	1,115
			1,000	515	940	550	1,005	590	1,070	635	1,140	680	1,215
			2,000	560	1,025	605	1,095	645	1,170	695	1,245	745	1,330
			3,000	615	1,115	660	1,195	710	1,275	760	1,365	815	1,455
			4,000	670	1,220	725	1,305	780	1,400	835	1,495	895	1,595
			5,000	740	1,340	795	1,435	855	1,535	920	1,640	985	1,755
			6,000	810	1,470	875	1,575	940	1,690	1,010	1,810	1,085	1,940
			7,000	895	1,620	965	1,740	1,035	1,865	1,115	2,000	1,195	2,145
			8,000	985	1,790	1,065	1,925	1,145	2,065	1,230	2,220	1,320	2,385

Pilots need to review their aircraft's performance chart when taking off at airports above sea level and/or when the temperature is above standard.





creases the aircraft's performance. Pilots also need to review their intended airports of landing to make sure they can get into and out of the airport at the times they plan on operating in and out of the airport. Pilots should also compute their true airspeeds at the expected density altitude to verify their landing distance. Whether you are flying in the desert or landing at a high altitude mountain airport, density altitude is a critical factor when flying into both areas.

Pilots must also remember the risks of flying in ground effect on take-off. Aircraft have plowed through fences and trees at the end of the runway when the aircraft could not climb out of ground effect because of operating at gross weight in high-density altitude situations. Long takeoff distances and lack of performances are all functions of high-density altitude. That is why Richardson said pilots have to know their aircraft's performance numbers.

## SAFETY IN ALTITUDE

When asked about safety recommendations for anyone flying across a desert area, Richardson's answer was simple. He said, "Fly high and within gliding distance of a highway."

He has a good point as I discovered later. I wanted some desert photographs without any nearby power lines in the scenes so I drove past his airport, went through Twentynine Palms, and continued driving miles beyond the last telephone and electric poles strung along the two-lane highway east of Twentynine Palms. The road eventually goes to Nevada. What emphasized his point and got my attention was the sign I passed on the eastside of Twentynine Palms that said the next services were 100 miles away. Although the Twentynine Palms area had developed significantly in the 28 years since I was last there, I would not want to break down along the road out in that desert within that 100 mile area between services. I especially would not want to be out there in the heat of a mid-summer day. In such conditions, lots of water and

shade to get out of the sun would become critical. I can tell you that as I drove along that desert road, I didn't count many cars passing me once I got beyond sight of the edge of town.

Although I could see a house here and there across the desert, it was not a place I would want to try walking across to get help. Although I was there in February and the temperature was cold, I would not have wanted to have to walk for help. People forget that a desert can be unbearably hot when the sun is shining, and cold at night. For example, Richardson's Hi-Desert Airport water fountain had ice floating in it late in the morning because the fountain was shaded.

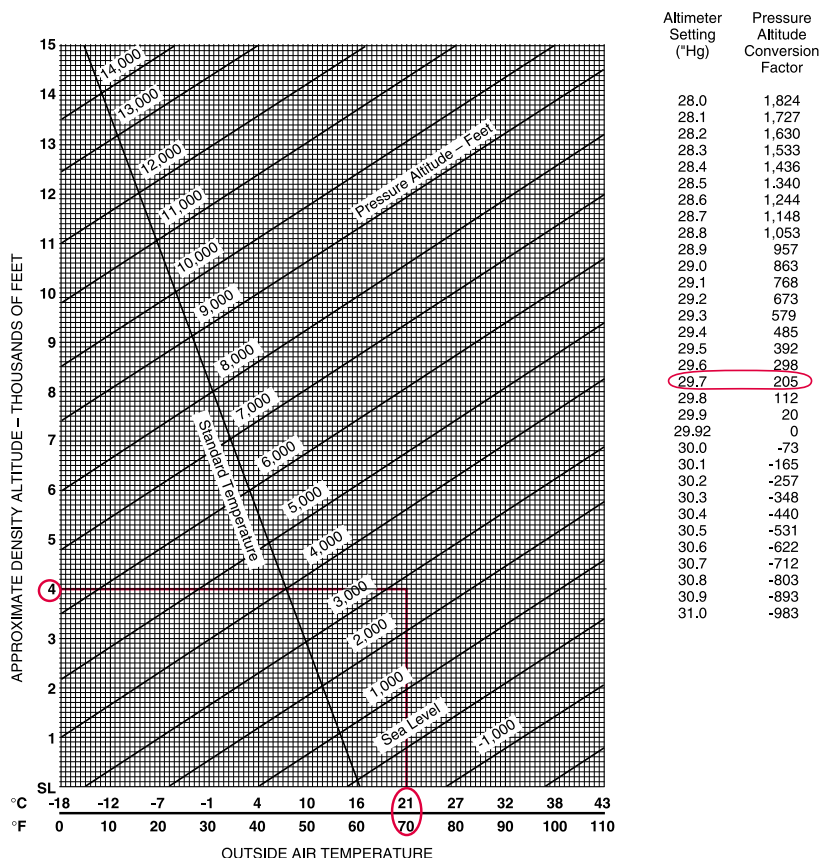
Richardson's advice to fly high and within gliding distance of a highway is important for several reasons. First is the fact that you might be able to land on the highway. Although deserts look flat at altitude, they are not the

best places to land on. Rough terrain, brush, and other vegetation can make for rough landings. By landing on or near a highway you increase your chances someone will drive by who can help you. Plus, it is easier (read cheaper) to get help to work on your downed aircraft or to recover your aircraft if you are near a road.

## ADVICE FROM A SEARCHER

Richardson's airport is located in San Bernardino County which according to Sergeant Paul Howe of the San Bernardino Sheriff's Department is the largest county in the lower 48 states at 22,000 square miles. Howe is a lead pilot/chief pilot in the Department's Aviation Division. Among its many duties, the Division provides full-time search and rescue support in the county. He said the Division works closely with the national Air Force Res-

DENSITY ALTITUDE CHART



cue Coordination Center as well as with the local Civil Air Patrol on searches.

When asked about what advice he would offer to someone planning on flying through his county's desert areas, he emphasized two things. One is to use flight following. The second is to talk to someone before you get into trouble. Whether you talk to Flight Service or Air Traffic Control, he stressed the need to talk to someone.

The Sheriff's Department provides its own flight following for the Department's aircraft. When asked what kind of survival gear the aircraft carry, he said their survival kits include extra water, space blankets, first aid kits, and during the winter flares, matches, and candles among other items because of the desert cold.

When summarizing what pilots planning on flying across this area should be aware of, Howe said, "They need to be aware of the weather, particularly in the summer." He said local conditions can change suddenly. He noted the dangers of storms and the fact that many people don't realize

how cold the desert can be during the winter.

### **ADVISE FROM ANOTHER PERSPECTIVE: ONE WHO TRAINS OTHERS**

In discussing this article with Roger W. Brownlow, FAA Regional Safety Program Manager for the Western Pacific Region, who works out of the Riverside, California Flight Standards District Office, he referred me to several people and organizations in his area including the Sheriff's Department's Aviation Division that he thought could provide valuable insight into desert survival and operations. One person he said to contact was Mr. Denny Hoekstra, Director of Aviation, Mission Aviation Fellowship. According to Hoekstra, the Fellowship operates 65 aircraft flying in 20 countries. An important part of the organization's training program is its Aviation Operations Manual (AOM). As Hoekstra reported, "These procedures have been carefully thought out and practiced in survival training."

One important point he made was

in their AOM, the survival kit is to be carried near the pilot and secured to the aircraft, so that it is always accessible even if the pilot is trapped or if a post-crash fire necessitates an immediate evacuation. He reported the medical kit is stored separately, though he noted, this will lessen your chances of escaping a fire with it. Because of the diverse terrain many of the pilots fly over, he said many pilots prefer to have a machete stored separately within reach of the pilot's seat.

The Fellowship aircraft also carry plastic covered, Immediate Action Placards that are kept in seat pockets or other visible places in the aircraft. The following is an example of one of the placards. Although the cards appear to be the same because they repeat certain information, they are different.

The value in the cards is they provide information to passengers who may not have had any survival training, and the cards are checklists for those who have had survival training.

Following the placard sample is a medical kit list of required items and a survival list of required items.



*Hi-Desert Airport provides an oasis for pilots flying near Joshua Tree, California.*





## IMMEDIATE ACTION SURVIVAL LIST

Survival Aid: The following placard should be prepared in English and the official language of the country. It should be covered with plastic or other protective material and a copy kept within easy access of both front and rear seat passengers.

### **IMMEDIATE ACTION**

STAY AWAY FROM THE AIRPLANE until the engine has cooled and spilled gas has evaporated.

CHECK INJURIES. GIVE FIRST AID. Make the injured comfortable. BE CAREFUL when removing injured people from the plane, PARTICULARLY WITH INJURED BACKS AND FRACTURES.

GET OUT OF THE WIND AND RAIN. Throw up a temporary shelter. IF YOU NEED A FIRE, START IT AT ONCE. In cold weather, make hot drinks.

GET SIGNALING EQUIPMENT READY. MAKE SURE THE EMERGENCY LOCATOR TRANSMITTER IS WORKING. (Use spare antenna if the normal one is in the mud, in thick foliage, or damaged.) Switch to manual operation. Set the plane's battery right side up so the fluid won't leak out. Disconnect it if it is shorted.

NOW—RELAX AND REST UNTIL YOU ARE OVER THE SHOCK OF THE CRASH. Leave extensive preparations and planning until later.

-----  
After resting, organize the camp. Appoint individuals to specific duties. Pool all food and equipment in charge of one person. Prepare a shelter to protect yourself from rain, hot sun, snow, wind, cold, or insects. Collect all possible fuel, both wood and gasoline from the plane. Try to have at least a day's supply of fuel on hand. Look for a water supply. Look for animal or plant food. Remember that you can survive for weeks with no food, IF you have water.

Prepare signals; disturb your surroundings so that you will be recognized from the air. Collect oil from the plane for smoke signaling. Get the ELT up out of the trees, if possible. If you are in a hollow, set it up on a nearby ridge top. WHAT YOU DO MAY BE THE KEY TO YOUR RESCUE.

Check out the plane's radio. If it can be made usable, get it ready. Determine your position by the best means available and include this information in radio messages.

Salvage all items you can use from the plane and whatever cargo was aboard. Don't forget the aircraft compass if it isn't too badly damaged.

Start a logbook. Include the date and cause of crash; probable location; roster of personnel; inventory of food, water, and equipment; weather conditions; and other pertinent data. STAY WITH THE AIRPLANE UNTIL YOU ARE FOUND!

## MEDICAL AND SURVIVAL CHECKLISTS

### **MAF REQUIRED MEDICAL/FIRST AID KIT**

Adhesive tape (waterproof)  
Antibiotic ointment (e.g., 3 in 1 First Aid Ointment™)  
Antiseptic swabs (8) should contain Iodine  
Band-Aids  
Blood stopper bandages  
Electrolyte tabs (20) (rehydration mix)  
Gauze pads (10)  
Gauze rolls  
Heat bar  
Insect repellent  
Latex tourniquet  
Lip balm/Sun screen  
Liquid soap  
Moleskin  
Snake bite kit  
Space blanket  
Steri-Strip wound closures  
Sun screen  
Tongue blades  
Triangular bandages (2)  
Un-Aspirin™ (25 pkgs.) (acetaminophen)  
Visine™ or equivalent (e.g., Liquid Tears™)  
Water purification tabs  
Water container  
Waterproof matches

### **SIGNALING EQUIPMENT—MAF REQUIREMENT**

Dye marker  
Orange signal flag  
Signaling mirror  
VHF portable radio, with spare alkaline battery pack  
Whistle

### **REQUIRED MISCELLANEOUS ITEMS**

Compass  
Disposable lighter  
First Aid Book  
Flashlight  
Immediate Action Card  
Swiss knife or pocket knife  
USAF Survival Manual  
NOTE: Some of the above items will have a shelf life.

### **SURVIVAL EQUIPMENT**

Can Openers  
Cook Stoves  
Compass  
Crash/Fire/Rescue Book  
Emergency Blankets



Fire Extinguishers  
First Aid Kits  
Foam Pads  
Insect Repellent  
Life Preservers  
Life Raft  
Medical Supplies  
Ration Packs  
Signs/Labels  
Survival Kits  
Survival Tools

## **SIGNAL EQUIPMENT**

Emergency Transmitter  
Flare Gun  
Flashlights  
Megaphone

The placard sample and list of medical and survival items is provided for your review in case you have never thought of building your own survival kit. Hopefully, they will provide you with a starting point in designing a kit for your own use. The Internet is also a good source of information.

## **HOW FAR IS FAR?**

One of the most important lessons everyone needs to learn who has not lived or traveled in desert country is the fact that distances are deceiving in the desert. An object, hill, mountain, or building that looks only a few miles away and seemingly within walking distance can be 10, 20, 30, or more miles away. When 50 or 60 miles visibility is common, you can't trust your eyes to tell you how far something is. An accurate map and a known position are the only things you can trust.

Not only can you not trust your eyes to tell you how far something is away from you, you cannot trust your body to be able to walk very far in the desert. Between the heat and rough surface, you are not going to walk very far very fast. Plus, without adequate water and protection from the sun, the exertion from trying to walk across the desert would quickly dehydrate you and start your downward spiral to heat exhaustion, sunstroke, and possibly death.

The reality of that situation was

brought home to me while talking with a military policeman at the Marine Air Ground Task Force Training Command, Marine Corps Air Ground Combat Center Twentynine Palms, California about my research for this article. He gave me his copy of the Command's *Ten Commandments of Survival in the Desert When Lost or Stranded*. Printed on a small, bright

day-glow colored card designed to be carried in a wallet, these 10 commandments were written and issued to Marines after some Marines died in the desert while on a training exercise at the base years ago.

Whether you are a Marine or a pilot stranded in the desert, the following guidelines provide information that could help save your life.

*Like the wind generators on the desert floor guarding the entrance to the Banning Pass northwest of Palm Springs, these generators stand guard on the ridgeline overlooking the entrance to the eastern entrance to the Pass. On the charts, these 296-foot tall towers are listed as windmills.*





## **TEN COMMANDMENTS OF SURVIVAL IN THE DESERT WHEN LOST OR STRANDED**

1. **HOLD ON TO A SURVIVAL ATTITUDE.** Your most valuable asset in any life-threatening situation is a positive mental attitude. If you aren't certain you can live, you will die.

2. **STAY WHERE YOU ARE—STAY CALM.** If you are driving a vehicle, remain with it. Relocate only to reach safety and water.

3. **MOVE ONLY WHEN ABSOLUTELY NECESSARY AND ONLY AT NIGHT.** If your position is unendurable, change your location during the cooler night hours. Move only when you know you can get there safely by doing the following:

- Leave a clear trail with notes and directional signs.
- On the note, give your name, date, time, direction, and reason you are going.
- Proceed in a specific direction; change your line of movement only after you have left a sign or marker.
- Go slowly and carefully—beware of overexertion.

4. **CONSERVE YOUR SWEAT, NOT YOUR WATER.** Rest by day; work on shelter and signals during cool of evening/morning. DRINK as often as you need water. Rub your body with urine and other liquids to keep cool.

5. **PROTECT YOUR BODY.** When in the sun and heat remember to:

- Keep your clothes on. Loosen, but do not remove them.
- Keep your boots/shoes and headgear on.
- Relax in deep shade, keeping your eyes protected from glare.
- If in the open with no shade nearby, use anything available to make shade.

6. **MAKE A FUSS WHEN YOU HEAR OR SEE OTHERS NEARBY.**

- Signal by any means at hand. Use a shaving mirror to reflect the sun. Wave a brightly colored item.
- Make marks in the sand or lay out rocks large enough to be seen from the air: SOS or HELP.
- Start Fire—smoke in the daytime and flame at night.
- Get involved in your rescue but conserve your body water.

7. **DO NOT EAT ANYTHING.**

- All food is water demanding. Water is drawn out of your system to process, digest, and eliminate what you eat.
- No salt or salt tabs—they will dehydrate you.

8. **KEEP YOUR MOUTH CLOSED.** Breathe through your nose to minimize evaporative water loss.

9. **THINK LIKE A SEARCHER.** Do the things that will make it easier for your rescuers to help you.

- Leave a clear trail with notes and directional signs.

b. On the note, give your name, day, time, direction, and reason you are going.

c. Have a goal in mind—go in one direction with care. AVOID INJURY.

10. **USE YOUR HEAD, NOT YOUR SWEAT; DRINK THE WATER YOU HAVE.** Never ration water! Drink what you have as you need it. Discipline is essential to survive.

### **COMMENT ON THE COMMANDMENTS**

As you can see, the commandments are mostly common sense. They are designed to give you some idea of how to survive in the desert until help arrives.

The key to survival is to minimize the amount of time you have to spend in the desert and how to make yourself visible to those searching for you. Remember it is easier to be found than to try to find help if you are ever stranded in the desert. An aircraft is easier to spot from the air than someone walking across the desert is. That is why the commandments stress remaining with your vehicle if at all possible rather than hiking out. But if you decide to hike out, remember to leave some type of message telling what your intentions are in case searchers find your aircraft. Make sure your message is visible and can be easily found.

### **AIRCRAFT RADIO AND ELT: TWO MEANS OF HELP**

As we have said, a basic survival kit with the knowledge how to use it and operating within your aircraft's performance will keep you out of trouble most of the time. In case you ever find yourself making an unplanned stop in a desert, consider you will need at least one gallon, preferably more, of water per person per day. You need some type of sunshade and clothes to protect yourself from the sun. You also need to have a means of communicating. Fortunately, you might be able to use your aircraft radio or your backup handheld radio to contact an overflying aircraft on either 121.5 MHz or the local air traffic en route frequency. You can find the local frequencies on your charts or in the FAA's *Airport/Facility Directory*. Remember to make sure your ELT is transmitting. This can be done by monitoring 121.5 MHz on your aircraft's radio or your handheld transceiver.

### **SUMMING UP: PLAN TO SURVIVE**

Considering how difficult and potentially dangerous it is to try walking out of the desert, do your best to plan your route of flight along major highways and population centers. The extra distance that might be involved in following a highway is worth the time in terms of the extra safety provided by keeping you within gliding distance of the road. If you have not reviewed your aircraft's published glide speed/distance chart recently, now might be a good time to review the data and how your aircraft has to be configured to meet the published data. Remember that wind affects your glide distance over the ground. Gliding down wind extends your distance and chances of finding a better place



to land. Gliding into the wind reduces your gliding distance over the ground and reduces your options.

Generally speaking, it is better to make an early decision to land off airport and plan and fly a normal pattern to a pre-selected spot than to make a last minute poor decision. You must always remember to fly your aircraft all of the way to the ground. Panic and loss of control are more deadly than an off-airport-controlled landing. An important safety rule to remember is the slower you can set your aircraft down without stalling it, the better. The slower the touchdown, the less energy the aircraft has to lose. The less impact energy you and the aircraft have to absorb during an off-airport landing, the better your chances of survival.

A good procedure is to always plan your flight for safety and then fly your plan. Finally, the importance of a filed and activated flight plan cannot be overstated.

### MORE INFORMATION

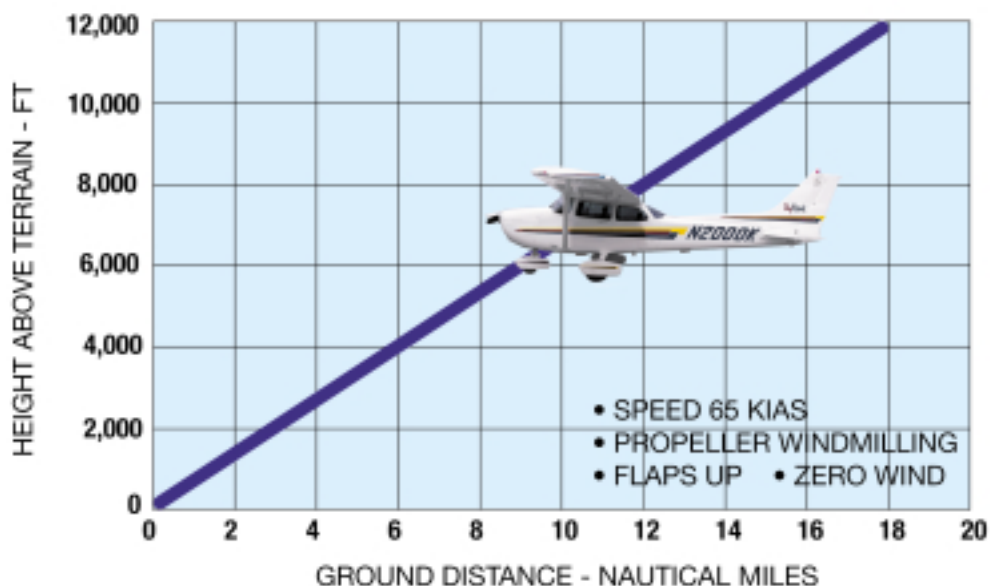
For more information about desert survival, you can check the Internet or your local library. If you are flying to a desert location that you are not familiar with, a very good information source is the FAA's Flight Standards District Office's Safety Program Manager (SPM) for the area. The SPM can either answer your questions or put you in contact with a local desert expert willing to help you. Your local SPM may have a copy of a relatively new FAA safety video on land survival you might want to review before your departure. It is your flight; plan it carefully.

For more information on heat-related data, the National Weather Service's Internet web site is a very good source. In addition, the Internet provides a great deal of information on heat-related subjects and dangers. ✈

*A train crosses this southern California areas east of Brawley, California. Not only is this land inhospitable, but the airspace is in the middle of military operating and restricted areas.*



### THE HIGHER YOU FLY—THE FURTHER YOU CAN GLIDE!





## FAA CONTACT NUMBERS

The following is a list of FAA Safety Program Managers in Flight Standards District Offices in or near desert areas.

### Northwest Mountain Region

Jimmie C. Herzfeld (OPS)  
Casper FSFO-04  
951 Werner Court, Suite 320  
Casper, WY 82601-1312  
COM: 307-261-5425 x25  
FAX: 307-261-5424  
jim.herzfeld@faa.gov

James P. Cooney (OPS)  
Helena FSDO-05  
2725 Skyway Drive, Suite 1  
Helena Regional Airport  
Helena, MT 59602-1213  
COM: 406-449-5270  
FAX: 406-449-5275  
james.cooney@faa.gov

Vacant  
Contact the office manager  
Salt Lake City FSDO, NM-07  
800-523-0268 ext. 130  
FAX: 801-524-5329

### Southwest Region

J. D. Huss (OPS)  
ABQ-FSDO-01  
ABQ International Airport  
1601 Randolph Rd SE,  
Suite 200N  
Albuquerque, NM 87106  
Com 505-764-1200  
Fax 505-764-1233

John Boatwright (OPS)  
LBB-FSDO-13  
Lubbock Airport  
Route 3, Box 51  
Lubbock, TX 79401-9712  
Com 806-740-3800  
Fax 806-740-3809

James Kelln (OPS)  
OKC-FSDO-15  
6125 SW 68<sup>th</sup> Street,  
Room 137  
P.O. Box 25082  
Oklahoma City, OK 73125  
COM: 405-951-4232

### Western Pacific Region

Jack Christopherson (OPS)  
SDL FSDO-7  
17777 N. Perimeter Dr., Suite 101  
Scottsdale, AZ 85255  
COM: 480-419-0600

Mike Harris (OPS)  
SAN FSDO-9  
8525 Gibbs Drive, Suite 120  
San Diego, CA 92123  
COM: 619-557-5281 ext 237

Richard Angelo (OPS)  
RNO FSDO-11  
4900 Energy Way  
Reno, NV 89502  
COM: 775-858-7700 ext 241

Jack Hocker (OPS)  
SJC FSDO-15  
1250 Aviation Ave., Suite 295  
San Jose, CA 95110-1130  
COM: 408-291-7681 ext 133

James Henry (OPS)  
FAT FSDO-17  
Fresno Air Terminal  
4955 E. Anderson, Suite 110

Fresno, CA 93727-1573  
COM: 209-487-5306 ext 247  
FAX: 209-454-8808

Nancy Haugarth (OPS)  
LAS FSDO-19  
7181 Amigo Street, Suite 180  
Las Vegas, NV 89119  
COM: 702 269-1445 ext 313  
Fax: 702-269-8013

R.C. Morton (OPS)  
RAL FSDO-21  
6961 Flight Road  
Riverside Municipal Airport  
Riverside, CA 92504-1991  
COM: 909-276-6701 x37  
FAX: 909-689-4309

Mark Galloway  
LAX FSDO-23  
2250 E. Imperial, Suite 140  
El Segundo, CA 90245  
COM: 310-215-2150 ext 154  
FAX: 310-645-3768

Howard Manning (OPS)  
OAK FSDO-27  
8517 Earhart Road, Suite 100  
Oakland, CA 94621-4500  
COM: 510 273-7155 ext 235



# NATIONAL WEATHER SERVICE'S REPORT ON HEAT DANGERS

**A**lthough this story started out discussing flying tips for operating in the American desert areas, it rapidly became obvious that pilots, flight crews, and passengers are heat risks wherever they operate in the summer. From the IFR pilot holding at the end of the taxiway for a clearance, to the air show pilot sitting on the taxiway waiting to perform, or to the glider pilot working a hot summer thermal, each is at risk from the heat and more importantly, from the danger of not drinking enough water. As noted in the National Weather Service's Heat Wave data, (see sidebar) people are at risk for heat problems whether they are on the flight line, in their aircraft, or at home in the city. Hopefully, this article reminds all pilots of the special dangers of summer. Heat related problems can be as deadly to a pilot as the lack of oxygen. One we talk about frequently, and we even have special altitude rules specifying when oxygen must be used and by whom, but seldom do we discuss heat problems and their effects on the ability of a pilot to control an aircraft in flight.

The seriousness of the danger heat poses for people is noted by the National Weather Service's *Heat Wave* statistic that in a normal year, about 175 Americans die as a result of summer heat. The attached *Heat Wave* data states, "In the disastrous heat wave of 1980, more than 1,250 people died."

## HEAT INDEX/HEAT DISORDERS

Heat Index	Possible heat disorders for people in higher risk groups
130°F or higher	Heatstroke/sunstroke highly likely with continued exposure.
105° - 130°F	Sunstroke, heat cramps, or heat exhaustion likely, and heatstroke possible with prolonged exposure and/or physical activity.
90° - 105°F	Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and/or physical activity.
80° - 90°F	Fatigue possible with prolonged exposure and/or physical activity.

## Know These Heat Disorder Symptoms

Heat Disorder	Symptoms	First Aid
<b>Sunburn</b>	Redness and pain. In severe cases, swelling of skin, blisters, fever, headaches.	Ointment for mild cases if blisters appear. If breaking occurs, apply dry sterile dressing. Serious, extensive cases should be seen by a physician.
<b>Heat Cramps</b>	Painful spasms usually in muscles of legs and abdomen possible. Heavy sweating.	Firm pressure on cramping muscles, or gentle massage to relieve spasm. Give sips of water. If nausea occurs, discontinue use.
<b>Heat Exhaustion</b>	Heavy sweating, weakness, skin cold, pale, and clammy. Pulse thready. Normal temperature possible. Fainting and vomiting.	Get victim out of sun. Lay down and loosen clothing. Apply cool wet cloths. Fan or move victim to air conditioned room. Sips of water. If nausea occurs, discontinue use. If vomiting continues, seek immediate medical attention.
<b>Heat Stroke (or Sunstroke)</b>	High body temperature (106°F or higher). Hot dry skin. Rapid and strong pulse. Possible unconsciousness.	<b>Heat stroke is a severe medical emergency. Summon medical assistance or get the victim to a hospital immediately. Delay can be fatal.</b>  Move victim to a cooler environment. Reduce body temperature with cold bath or sponging. Use extreme caution. Remove clothing, use fans and air conditioners. If temperature rises again, repeat process. Do not give fluids.







*From the sand dunes near Brawley to the mountains near the San Jacinto Wilderness Area, pictured above, California's landscape could provide a challenge to the unprepared.*





# NIGHT VISION DANGERS

If you don't survive your crash, it is pointless to discuss post-crash desert survival. To illustrate this point, Mr. Robert J. O'Haver, an FAA Aviation Safety Inspector assigned to the Flight Standards Service's General Aviation and Commercial Division's Operations and Safety Program Support Branch in Washington, DC, told the following story. Although he thinks the story may make him look foolish, it is a good reminder to those pilots who have never flown with 60 or more miles of nighttime visibility of the dangers that may be lurking in a clear, moonless desert night. O'Haver, who has flown extensively throughout New Mexico, said pilots have to remember the lights they might see in the desert at night may be 60 to 80 miles away. He said long-range night visibility can be potentially hazardous for those not aware of the risks it poses.

To illustrate his point, he told the story about one of his flights in a Beechcraft *King Air* on a dark, moonless night. "I was flying about 10 or 11,000 feet IFR. I could see the lights of cars moving along a road across the desert. It was easy to start using the lights as the horizon. But after a while, I realized that the aircraft was turning. I kicked in some rudder to stop the turn when I realized that the problem was the road was now slanting across a mountain. I had been trying to use the sloping line of lights on the mountain as the level horizon."

He told about a nighttime turbojet accident that happened when the crew flew into a blacked-out hill after they lost sight of the airport lights. Blacked-out areas are particularly dangerous in remote areas where there are few or no ground lights. A good rule of thumb when flying anywhere at night is that normally in built-

up areas people build houses everywhere. A black hole or an area with no lights either means a mountain, hill, or body of water. There has to be some reason people didn't build in that area if the rest of the area is built-up and lighted. That reason could be dangerous to an aircraft.

"To avoid such problems," he said, "pilots need to review the *Aeronautical Information Manual's* (AIM) section on visual effects to avoid a similar nighttime accident when flying on moonless nights over the desert."

Pilots interested in learning more about the effects of vision on flying can review AIM paragraph 8-1-5, *Illusions in Flight*. O'Haver's illusion that night is called "false horizon." A condition of an aircraft not being correctly aligned with the actual horizon. For those not aware of such illusions, the potential risks can be deadly. The AIM section on illusions also includes illusions leading to landing errors.

*It is a long walk for help, unless you fly high and near a highway.*







*Park Richardson, owner of Hi-Desert Airport, Joshua Tree, California, shares his knowledge of desert flying based upon his years of owning a high desert airport.*



*For those not familiar with the term high desert, it refers to the elevation of the area. For example, Richardson's Hi Desert Airport's office area, shown here, is at 2,464 feet mean sea level (MSL). The nearby Yucca Valley airport is 3,224 feet MSL. Both are located in the high desert area north of Palm Springs. Palm Springs International airport is located in the low desert at an elevation of only 474 feet MSL. Nearby Desert Resorts Regional airport is a minus 114 feet MSL. On a very hot day, that 2,000 plus foot altitude difference can have an important impact on an aircraft's density altitude performance.*

U.S. Department  
of Transportation

Federal Aviation  
Administration

800 Independence Ave., S.W.  
Washington, D.C. 20591

Official Business  
Penalty for Private Use \$300

DO NOT DELAY -- CRITICAL TO FLIGHT SAFETY!

